



News Release

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U.S. Army develops technology to preserve foodstuffs ***Volatile Organic Compound applications detect biological pathogens***

ABERDEEN PROVING GROUND, Md. – Scientists at the U.S. Army Edgewood Chemical Biological Center (ECBC), are fine-tuning the powerful sense of smell and integrating it into a technology that can protect food supplies, identify biological agents and equip the Warfighter with newfound capabilities.

“Dogs are actually used for quite a lot of things throughout the military for detection as well as law enforcement,” said Calvin Chue, Ph.D., a research biologist at ECBC, located at the Edgewood Area of the Aberdeen Proving Ground, Md.

According to Chue, nearly all living creatures or biological materials give off a specific profile of organic compounds, or a unique smell. Those compounds can be detected and identified using a Volatile Organic Compound (VOC) visual indicator that was developed in 2000 by Ken Suslick, Ph.D., at a laboratory at the University of Illinois at Urbana-Champaign. When biological materials react in the presence of a specific individual compound, the VOC detection application reveals unique patterns that illuminate a certain color after five hours of exposure.

ECBC is teaming with Specific Technologies (Mountain View, CA), through a cooperative research and development agreement (CRADA) to utilize the VOC detection application with the military in mind. What was once used to determine whether coffee beans were Starbucks or Folgers, could now be used to discern biological agents or test for the spoiling of foodstuffs.

“We’ve been working with them [Science Technologies] as well as the Defense Science Technology Laboratory in Great Britain to validate and verify the same technology can be applied to biological agents, and we will expand it to food stuffs and transport issues,” explained Chue.

“We believe it will significantly help troops with their supply and logistics chain. If the Warfighter just received a shipment of grapes or meat or dairy from the United States, it may look good but what do you have that tells you that this is going to spoil in a day versus a week? This kind of technology can help.”

The paper-based colorimetric array is a series of dots that change color over time as the paper is exposed to various odorants. After taking a simple photograph of the colors, it can then be scanned and run through a software application that identifies what compounds are present. According to Chue, ECBC has been working on VOC detection for the past 10 years using a different method called gas chromatography as a way to replace the use of dogs on detection missions. The gas chromatography technology, however, proved to be a burdensome and complex project that required specific training for the large, non-portable equipment.

With the innovative VOC detection applications, Chue and the ECBC team are able to broaden the scope of work for implementation in the military arena at a cost-effective rate. Right now, scientists are developing ways to embed the VOC technology into mason jars in order to better evaluate the foodstuffs inside and determine the preservation rate. Other avenues of implementation could protect the Warfighter from biological agents that may have contaminated a container or item.

“We are integrating this kind of technology into a variety of mechanisms, but those mechanisms need to be decided. There are a number of fields that this will ultimately benefit and could actually have a wide range of applications,” said Chue. “We envision this growing into a mobile platform where it could be inserted into various containers that you could take a picture of in order to determine the state of the VOCs inside.”

It is ECBC’s mission to integrate lifecycle science, engineering and operations solutions to counter chemical-biological threats, and the VOC detection applications being developed by the Center and its partners is a progressive way to advance the safety of U.S. forces and the Nation.

For more information about ECBC, visit <http://www.ecbc.army.mil/>.

ECBC is the Army’s principal research and development center for chemical and biological defense technology, engineering and field operations. ECBC has achieved major technological advances for the warfighter and for our national defense, with a long and distinguished history of providing the Armed Forces with quality systems and outstanding customer service. ECBC is a U.S. Army Research, Development and Engineering Command laboratory located at the Edgewood Area of Aberdeen Proving Ground, Maryland. For more information about the Edgewood Chemical Biological Center, please visit our website at <http://www.ecbc.army.mil> or call (410) 436-7118.

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